

What is claimed is:

1. A paper medium based composition comprising

a substrate;

an undercoat layer;

5 a barrier coating; and

one or more ink receptive coating (s).

2. The composition of claim 1 further comprising:

one or more anticurl layers.

3. The composition in claim 1 wherein the substrate comprises:

10 one or more fiber;

one or more starch;

one or more inorganic filler;

one or more retention aid;

one or more formation aid;

15 one or more plasticizer;

one or more slip agent;

one or more dye;

one or more hydrophobic additive;

4. The composition of claim 3 wherein the plasticizer comprises one or more of the group consisting of polyethylene glycol and glycerine.

5. The composition of claim 1 wherein the undercoat layer comprises:

5 one or more inorganic pigment;

one or more latex;

one or more binder;

one or more flow agent;

one or more slip agent;

10 one or more dye; and

one or more additive.

6. The composition of claim 1 wherein the barrier coating comprises:

one or more monomer;

one or more oligomer; and

15 one or more photoinitiators.

7. The composition of claim 6 wherein the monomer comprises one or more of the group consisting of a urethane, an epoxy and an acrylate.

8. The composition of claim 6 wherein the oligomer comprises one or more of the group consisting of a urethane, an epoxy and an acrylate.
9. The composition of claim 6 wherein the monomer is between about 1 and about 100 dry percent of the composition.
- 5 10. The composition of claim 6 wherein the oligomer is between about 1 and about 100 dry percent of the composition.
11. The composition of claim 6 wherein the photoinitiator(s) are between about 1 and 20 dry percent of the composition.
12. The composition of claim 1 wherein the barrier coating is treated with:  
10 a corona discharge.
13. The composition of claim 1 wherein the barrier coating is treated with:  
flame treatment.
14. The composition of claim 1 wherein the barrier coating is treated with:  
subbing coating.
- 15 15. The composition of claim 1 comprising one or more ink receptive layer(s) comprising one or more absorbent materials.
16. The composition of claim 1 wherein one or more ink receptive layers is covered by the barrier layer.

17. The composition of claim 1 wherein said ink receptive layer(s) comprises one or more materials selected from the group of hydrophilic polymers consisting of polyvinyl alcohol, gelatin, methylcellulose, hydroxyethylcellulose, propylhydroxycellulose, and polyvinyl pyrrolidone.

5 18. The composition of claim 1 wherein said ink receptive layer(s) comprise one or more cationic polymer material selected from the group consisting of polydadmacs, polyethylene imines, polyamides, and polyamines.

19. The composition of claim 17 wherein the water loving polymer is between about 10 and about 100 dry percent of the composition.

10 20. The composition of claim 18 wherein the cationic polymer material is between about 0.1 and about 20 dry percent of the composition.

21. The composition of claim 1 wherein said ink receptive layer(s) comprise one or more latex binders selected from the group consisting of styrene butadiene, polyvinyl acetate, acrylic, vinyl-acetate, ethylene-vinyl chloride, and urethane.

15 22. The composition of claim 21 wherein the latex binder is between about 0 and about 30 dry percent of the composition.

23. The composition of claim 1 wherein said ink receptive layer(s) comprise one or more cross-linking agent selected from the group consisting of aziradines and chrom alum.

20 24. The composition of claim 23 wherein the cross-linking agent is between about 0.01 and about 20 dry percent of the composition.

25. The composition of claim 1 wherein said ink receptive layer(s) comprise one or more inorganic pigments selected from the group consisting of colloidal silica, precipitated silica, fumed silica, gel silica, clay, an alumina, and a calcium carbonate.

26. The composition of claim 25 wherein the inorganic pigment is between about 0 and about 75 dry percent of the composition.

27. The composition of claim 1 comprising said ink receptive layer(s) comprise one or more color pigmented and brightener dye.

28. The composition of claim 1 further comprising one or more flow agent.

29. The composition of claim 1 further comprising one or more coating additive.

30. The composition of claim 1 wherein the ink receptive coating is coated at a coat weight of between about 1 and about 50 dry gsm.

31. The composition of claim 1 further comprising a plasticizer.

32. The composition of claim 2 wherein said anti-curl layers applied to a side of the substrate, said side opposite a side on which an undercoat layer is located.

33. The composition of claim 2 wherein the anti-curl layer comprises:

one or more hydrophilic polymer;

one or more crosslinking agent; and

one or more inorganic pigment.

34. The composition of claim 33 wherein the anti-curl layer further comprises one or more latex binders.

35. The composition of claim 33 wherein the water loving polymer comprises one or more of the group consisting of gelatin, polyvinyl alcohol, protein, starch, methylcellulose,

5 hydroxyethylcellulose, propylhydroxycellulose, and carboxymethylcellulose.

36. The composition of claim 33 wherein the water loving polymer is between about 1 and about 100 dry percent of the composition.

37. The composition of claim 34 wherein the latex binder comprises one or more of the group consisting of styrene-butadiene, polyvinyl acetate, acrylic, vinyl-acetate, ethylene-vinyl chloride,  
10 and urethane.

38. The composition of claim 34 wherein the latex binder is between about 1 and about 70 dry percent of the composition.

39. The composition of claim 33 wherein the crosslinking agent comprises one or more of the group consisting of aziradine, chrom alum, and glyoxal.

15 40. The composition of claim 33 wherein the crosslinking agent is between about 0.01 and about 20 dry percent of the composition.

41. The composition of claim 33 wherein the inorganic pigment comprises one or more of the group consisting of colloidal silica, precipitated silica, fumed silica, gel silica, clay, alumina, and calcium carbonate.

42. The composition of claim 33 wherein the inorganic pigment is between about 1 and about 75 dry percent of the composition.

43. The composition of claim 33 wherein the anti-curl layer is coated at a coat weight of between about 1 and about 50 dry gsm.

5 44. The composition of claim 1 wherein the barrier coating has a surface energy of about 48 to about 55 dynes.

45. The composition of claim 1 wherein the barrier coating has a surface energy of about 30 to about 55 dynes.

46. The composition of claim 1 wherein the barrier coating comprises polyethylene.

10 47. The composition of claim 1 wherein the barrier coating is cured via one or more of the group consisting of ultraviolet energy, electron beam energy, and thermal energy.

48. The composition of claim 1 wherein the barrier coating is coated at a coat weight between about 1 to about 30 dry gsm.

15 49. The composition of claim 1 wherein the barrier coating is coated at a coat weight between about 2 to about 9 dry gsm.

50. The composition of claim 1 wherein the ink receptive coating(s) is coated at a coat weight between about 1 to about 22 dry gsm.

51. The composition of claim 32 wherein the anticurl coating is coated at a coat weight of about 3 to about 15 dry gsm.

52. The composition comprising:

a substrate comprising 20% hardwood fibers, about 55% softwood fibers and about 25% precipitated calcium carbonate;

an undercoat layer comprising about 72 parts clay, about 10 parts synthetic plastic pigment, 5 parts polyvinyl acetate latex, about 0.09 parts defoamer, about 0.18 parts carboxymethylcellulose, about 0.05 parts dispersant, about 0.41 parts flow and leveling agent and about 2 parts optical brightener;

a barrier layer comprising about 15 parts aromatic monoacrylate oligomer, about 105 parts tri(2-hydroxyethyl)isocyanurate triacrylate, about 99 parts ethoxylated trimethylolpropane triacrylate and about 24 parts phenyl propanone photoinitiator;

a first ink receptive coating comprising about 196 parts gelatin, about 2.3 parts acrylic cationic polymer, about 2.3 parts water loving cationic polymer, about 0.13 parts flow agent, about 0.75 parts optical brightener, about 0.04 parts crosslinker, about 0.43 parts pH adjuster and about 0.22 parts crosslinker;

a second ink receptive coating comprising about 11.5 parts polyvinyl alcohol, about 46 parts hydroxypropylcellulose, about 3 parts acrylic latex, about 13.5 parts polyethylene oxide, about 4 parts hydrophilic cationic polymer, about 3 parts lipophilic cationic polymer, about 20 parts pseudobohemite alumina, about 0.2 parts surfactant and about 2 parts calcium chloride; and

an anticurl coating comprising about 56 parts gelatin, about 42 parts gel silica, about 0.5 parts chrom alum, and about 0.1 parts flow agent.